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ABSTRACT

Investigated were effects of maternal work status and parity on specific outcomes in maternal psychology and physiology and infant physiology. In addition, the study design and the usefulness of instruments were evaluated, and the feasibility of subject recruitment and retention was assessed. Subjects were 20 women between 18 and 35 years of age who were either employed outside the home or not employed, and were experiencing their first or second pregnancy. Data were collected at 14-24 weeks of pregnancy (Phase 1), following delivery (Phase 2), 4-6 weeks postpartum (Phase 3), and when the infant was 6 months old (Phase 4). Findings at Phase 1 indicated that second-time mothers were older than first-time mothers, and nonemployed mothers were significantly more likely to smoke than were employed mothers. Phase 2 findings indicated nonemployed mothers accounted for four of seven complicated pregnancies and their infants scored significantly lower on the Dubowitz gestational scale than did infants of employed mothers. Phase 3 results indicated that nonemployed mothers had more concerns about separation from their infants. Their level of family function was lower than that of employed mothers. At Phase 4, employed mothers had significantly more concerns about separation effects on their infants. Attrition was highest among the first-time, nonemployed mothers who had the most complications. (RH)

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Maternal Work Status and Pregnancy Outcomes: A Pilot

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Abstract

Today many mothers of young infants continue to be employed outside the home. Evidence indicates that their work status may be related to pregnancy and infant outcomes. The aims of this pilot study were to (1) describe specific pregnancy and infant outcomes by maternal work status and parity, (2) evaluate the study design including the usefulness of the instruments, and (3) assess the feasibility of subject recruitment and retention. The subjects were 20 pregnant women (ages 18 to 35) equally divided by work status and parity. Women were either employed outside the home or were not employed; they were experiencing their first or second pregnancy. Data (chart reviews, semi-structured interviews, questionnaires, and the Brazelton Neonatal Assessment) were collected at 14-24 weeks of pregnancy (Phase 1), following delivery (Phase 2), 4-6 weeks postpartum (Phase 3), and 6 months infant age (Phase 4). Wilcoxon 2 sample tests for comparisons revealed two differences between the groups at Phase 1. Second-time mothers were older than first-time mothers and nonemployed mothers were significantly more likely to smoke than were the employed mothers. Phase 2 findings indicated 7 mothers experienced pregnancy complications. Nonemployed mothers accounted for 4 of the 7 complicated pregnancies and their infants scored significantly lower on the Dubowitz gestational scale ($p = .01$) than did infants of employed mothers. Phase 3 results indicated that nonemployed mothers had more concerns about separation from their infants. Their level of family function, as measured by the Family Apgar was lower, though not statistically significant from that of the employed mothers. At Phase 4 employed mothers had significantly more concerns about separation effects on their infants. Attrition was highest among the first-time, nonemployed mothers who numerically had the most complications.

Serendipitous findings from a dissertation study of maternal separation anxiety in 40 mothers of second-born infants revealed an unexpected number of pregnancy complications (Pitzer, 1985). The complications were identified when mothers responded to the question, "How did your second pregnancy, labor and delivery compare with your first experience?" These were self-reports uncorroborated by medical data. (Table 1).

Verbrugge (1986), Waldron (1980), Woods and Hulka (1979), and Woods (1987) have found that employed women, when compared to unemployed women are healthier. Hibbard and Pope (1985) have noted differences in women's health by age, type of employment, social support and social integration.

The literature is inconclusive as to whether maternal employment during pregnancy contributes to an increased risk of complications. Alegre, Rodriguez-Escudero, Cruz, and Prada (1984); Balfour (1938); and Hoffman and Bakketeig (1984) report greater risk for employed mothers. Chamberlain and Garcia (1983); Mamelle and Laumon (1984); and Marbury, Linn, Monson et al. (1984) report no differences by work status for complications. Murphy, Dauncy, and Newcombe (1984), report that nonemployed mothers have a greater risk for pregnancy complications.

There appears to be a selection into the work force of mothers who are both healthier and more likely to have good perinatal outcomes because of certain characteristics (higher age, SES, education). Employment itself may be beneficial to pregnant women because it involves outside contacts (potential support people) and access to information and resources that are not obviously available to nonemployed women (Murphy et al., 1984).

Bias may be inherent in the work-status research related to pregnancy

since women who work during pregnancy differ in many ways from those who do not (Beral, Grisso, & Roman, 1985; Joffe, 1985). The less privileged group may have more pressures and fewer resources that influence their health status. Another bias is that women with a difficult pregnancy are more likely to leave employment early during pregnancy (Joffe, 1985, p. 122).

The purposes of this study were to (1) describe specific pregnancy and infant outcomes by maternal work status and parity, (2) evaluate the study design, including the instruments, and (3) assess recruitment and retention of subjects prior to attempting a larger study.

Variables

The independent variables were maternal work status and parity (this was the first or second pregnancy resulting in a viable infant). The dependent variables were maternal physiological and psychological (Maternal Separation Anxiety, perceived family functioning, and perceived health) outcomes and infant physiological outcomes. Work status was measured by self-report; parity was determined by chart review and self-report. Maternal outcomes were measured by chart reviews, questionnaires, and interviews. Infant outcomes were measured by chart reviews (Apgar scores, birth weight and length, gestational age, and by the Brazelton Neonatal Assessment Scale (1973)).

Sample

A convenience sample of 20 women was drawn from a tertiary university ambulatory antepartal clinic. Subjects who met the following criteria: (1) no chronic illness or pregnancy-related complications at time of enrollment; (2) no previous pregnancy problems; (3) presently in the midtrimester of a singleton pregnancy; (4) high school graduate, (5) 18 to 35 years of age; and

(6) parity either zero or one were equally divided by parity and work status. Only two women who met the criteria declined to participate.

All second-time mothers had another living child. Their first pregnancies resulted in normal, uncomplicated, term deliveries. I had intended to enroll only mothers employed full-time, but found that this criterion was too limiting for a pilot of this size and modified it to 'working outside the home at least 10 hours/week'. Group demographics (Table 4) included means of 24.42 years of age, 13.35 years of education, and 32.28 on the Duncan Prestige Score of SES (indicating lower middle class status, although the range was quite broad, 18.00 to 58.51) (Stevens & Featherman, 1981). One-half of the mothers were Caucasian, and the other half were Black. Seventeen of the mothers were married to or living with the father of the baby; three mothers were single and reported no involvement with the infants' fathers.

Eleven of the mothers reported smoking during this pregnancy. This is important information as there is growing evidence of the relationship between level (dose related) of smoking and prenatal complications (Alexander, 1987). Smoking habits have been shown to differ by employment status and occupation. According to Ventura and Hendershot (1984) professionally employed mothers are least likely to smoke during pregnancy; mothers not employed or those working in sales and clerical occupations are most likely to smoke.

Methodology

A descriptive, ex post facto design was used to follow subjects from midpregnancy to 6 months postpartum. Data were collected in four phases, midpregnancy in the clinic setting (Phase 1), 1-2 days postpartum in the

hospital (Phase 2), 4-6 six weeks postpartum in the clinic (Phase 3), and 6 months postpartum in the subjects' homes. Findings reported in this paper are limited to the maternal outcomes at Phases 2, 3, and 4 and infant outcomes at birth (Phase 2).

Instruments

A primary source of data was Chart Reviews which focused on maternal health during pregnancy and maternal and infant health outcomes. Incidence of individual complications was noted as was the type of delivery. Infant records were reviewed for birth weight and length, Apgars at 1 and 5 minutes following birth, gestational age, and physicians' discharge summary. In addition mothers completed the following questionnaires.

The Maternal Separation Anxiety Scale (MSAS) is a 35-item, 3-scale, self-administered questionnaire designed to measure three dimensions contributing a mother's concerns about separation from her child. Mothers completed the MSAS at Phases 1, 3, and 4.

The Taylor Manifest Anxiety Scale (TMAS) (Taylor, 1953) consists of 50 true/false items drawn from the Minnesota Multiphasic Personality Inventory (MMPI) which have been judged by clinicians as indicative of manifest trait anxiety. The TMAS has correlated with the MSAS in the .30 range in a population of healthy mothers (Hock et al., 1984). This was completed at Phases 1 and 4.

The Smilkstein Family Apgar, a 5-item questionnaire designed by Smilkstein (1978) was used to measure the mother's perception of family functioning. This measure taps her satisfaction with adaptation, partnership, growth, affection, and resolve within the family. In this study mothers

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selected one of three choices: 'almost always', 2 points; 'some of the time', 1 point; or 'hardly ever', 0 points for each item. The scores for each of the five questions are totaled; a score of 7 to 10 suggests a highly functional family, a score of 4-6 a moderately dysfunctional family, and a score of 0 to 3 a severely dysfunctional family. The Family Appgar was completed at Phases 3 and 4.

The Ware Health Perceptions Questionnaire (1976), which provides information about an individual's beliefs regarding various aspects of her health status, was given at Phase 4.

A semi-structured taped Interview was used to gather demographics and information about role investment in mothering and employment, attitudes toward pregnancy, and work-status preference. During Phases 2, 3, and 4 Interviews were used to gather additional pregnancy, work history, and health information on both mother and infant.

A Brazelton Neonatal Assessment (1973) was completed on 16 of the infants within the first few days of life (phase 2) by an examiner trained in the use of the instrument.

Analysis

Quantitative data were analyzed using SAS (1982) programs for descriptive statistics, the Wilcoxon 2 sample test for comparisons by work status and by parity, and Spearman Rank Correlations to reveal relationships.

Findings at Phase 1 indicated that second-time mothers were significantly older than first-time mothers (not surprisingly). More importantly, nonworking mothers were significantly more likely to smoke (Table 3). Though

not significantly different, working mothers were older, had more education, and were more likely to be married.

When interviewed at Phase 2 (1-2 days postpartum) seven mothers had experienced pregnancy complications. Although not statistically different, the nonemployed mothers had more complications; some of them had more than one complication. Percentages and types of complications by work status are given in Table 4. In addition, infants of nonemployed mothers scored significantly lower on the Dubowitz gestational scale ($p < .01$) than did infants of employed mothers. The infants of nonworking mothers had lower, but not statistically different birth weights (mean = 2,835 grams, range = 964 to 3,790 grams).

Phase 3 comparisons revealed that the nonemployed mothers had significantly more guilt, worry, and sadness related to leaving their infants (MSAS Subscale 1) and experienced more overall separation anxiety than the employed mothers ($Z = 1.92, p < .05$).

The mothers' MSAS varied by work status and phase of the study. By Phase 4 the employed mothers demonstrated significantly more concerns about how separation affected their infants than did the nonemployed mothers ($Z = 1.94, p < .05$). These comparisons are given in Table 5.

The Family Apgar, the Health Perceptions and the TMAS mean scores did not vary significantly by group at any phase. No meaningful interpretation of change, by group, was possible because of the small number of returned questionnaires at Phases 3 and 4. TMAS mean scores did, however, correlate with the MSAS Total ($r = .83, p < .01$) at Phase 4. This relationship, however, is much, much higher than previously reported (Hock, et al., 1984) and may be caused by the small population remaining in Phase 4. An alternative

Interpretation is that this population was more anxious. Numerically the nonemployed mothers' TMAS mean scores were higher than those of the employed mothers. Both first- and second-time nonemployed mothers increased their TMAS mean score values from Phase 1 to Phase 4 (first-time mothers changed from 13.77 to 24.00 and second-time mothers from 15.30 to 19.00). Both groups' second scores were higher than those reported by Taylor (1953) in a population of freshman college students (mean = 14.56), but not as high as found with psychiatric patients (mean 34.00).

I was also alarmed to find that two mothers gave scores of 1 on the Family Apgar. The Family Apgar mean scores were higher, but not significantly different, for the employed mothers (9.00 vs 7.50) at Phase 3 (Table 7).

As can be seen in Table 6 significant correlations were noted between hours work/week (Phase 1) and the MSAS responses at Phase 3 (6 weeks postpartum). The level of anxiety decreased as the number of hours worked/week increased. Infant gestational age was positively related to hours worked/week (considering nonemployment as zero hours). Mothers' SES was negatively related to their concern, worry, and sadness related to leaving their infants (Subscale 1 of MSAS). Education was positively related to Family Apgar mean scores; mothers' perception of family functioning went up with their level of education. Mothers' and fathers' SES were positively related to infants' Brazelton scores on the autonomic stability and motor scales. Not included in this slide is a relationship between change of job within past year by spouse/support person and mother having to stand frequently while at work ($r = -.44$, $p < .05$). Significant Spearman Rank Correlation coefficients were also noted between more physical activity and

the complications of preterm birth ($r = -.44$, $p = < .05$) and with placenta previa ($r = -.49$, $p < .05$).

Attrition was highest in the nonemployed, first-time mothers. Meaningful description of this group at Phase 4 is difficult since only one subject was retained. This subject was not married when enrolled in the study, but she and the father of the baby were married before her delivery. The others in this group ($n = 4$) were unmarried; of these, only one reported having support from the father of the infant. In contrast, all nonemployed, second-time mothers were retained. One mother was lost from the employed, second-time mothers, and two from the employed, first-time mothers. The total attrition was 35%.

Discussion

Differences in maternal and infant outcomes by work status were observed and, though sample size is small, these outcomes were consistent with the earlier findings of Murphy et al. (1984) that nonemployed mothers have more difficult pregnancies. There is also a good possibility of selection bias as population was predominately lower middle SES.

Nonemployment appears to be a contributor to the incidence of complications, but many more variables are involved. Whether mother has another child at home also had some impact. Having a first baby and being nonemployed were important characteristics of subjects lost from the study. Parity revealed only one significant difference by group and it failed to correlate with any of the outcome variables.

Evaluation of the instruments was difficult in view of the limited number of subjects and the diminished number of responses available for Phases 3 and

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4. My sense is that chart reviews and semi-structured interviews provided the most important data. The MSAS responses most frequently correlated significantly with the demographics. The relationships noted are consistent with earlier studies using the MSAS (Hock et al., 1984, Pitzer, 1984/1985).

Mothers with less resources (education and economic) were more likely to suffer pregnancy complications. This finding is consistent with other, large-scale studies (Behrman, 1985; Murphy et al., 1984).

The third purpose, to assess subject recruitment and retention, was useful. Recruitment was slower than expected as the study was limited to healthy first- and second-time mothers with no previous pregnancy problems. The setting where the sample was obtained has an above average-rate of high-risk clients. Over the ten months of data collection, 35% of the sample was lost; 20% was lost from one subgroup.

Future research must allow for this attrition rate and incorporate clients from a more typical antepartal setting to avoid further bias in subject selection (Beral, Grisso, & Roman, 1985). The difficulty in recruiting nonworking, first-time healthy mothers is a indirect observation that most women today are working prior to the birth of their first children. Nonemployed, first-time mothers were younger, mostly unmarried, less educated, and had more complications than the women retained in the study. They are the group in need of preventative health care, and in this situation, the least accessible. Retention of this population as subjects in future research remains a challenge.

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Table 1

Percentage of Complicationss during Second Pregnancy
and History of Previous Complications
N = 40

Variable Percentage	n	
Preterm labor	6	15.0
Preterm birth/small for gestational age infant	5	12.5
Ill infant/prolonged hospitalization	6	15.0
Placental disorders	5	12.5
Gestational diabetes	2	5.0
Postpartum depression	1	2.5
History of Previous Complications		
Stillbirth	1	2.5
Tubal pregnancy	3	7.5
Infertility problems	3	7.5
Placental disorders	3	7.5
Miscarriage(s)	6	15.0
Cancer of the cervix	1	2.5
Preterm birth/ill newborn	2	5.0
Pregnancy-induced hypertension	1	2.5

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Table 2

Demographics by Group.
Phase 1, $n = 20$

Group ($n = 5$ each)	WPO	WP1	NWPO	NWP1
Variable (Mean)				
Age	23.6	28.6	19.4	27.6
Education (years)	13.6	13.4	12.0	13.2
Married: Yes	3	3	-	2
No	2	2	5	3
Race: Caucasian	4	1	2	3
Black	1	4	3	2
SES (Duncan Prestige Score)	35.0	35.42	24.29	33.2

.Group: WPO = working, first infant
 WP1 = working, second infant
 NWPO = nonworking, first infant
 NWP1 = nonworking, second infant

Table 3

Wilcoxon Two-sample Test
Smoking During Pregnancy by Work Status
 $n = 11$.

Smoked/Pregnancy	n	Z	p
Work	2		
Nonwork	9	-1.92	.04

.11 subjects of the total N of 20 smoked

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Table 4

Type & Incidence of Pregnancy Complication
by Group.
N = 18

Complications	Preterm labor	Preterm birth	Placenta previa	Gestational diabetes	PIH _b	ABO _c
Group						
WP0						
WP1	2	1				1
NWP0	2	2	1		1	
NWP1			1	1		

^aGroup:

WP0, n = 5, working, first infant

WP1, n = 4, working, second infant

NWP0, n = 4, nonworking, first infant

NWP1, n = 5, nonworking, second infant

^bPIH: Pregnancy Induced Hypertension

^cABO: Second Trimester Abortion

Table 5

Wilcoxon Two-Sample Comparisons
Maternal Separation Anxiety (MSAS) by Work Status
N = 15_a

Variable	Mean	S.D.	Z	p
MSAS (Subscale 1) _a				
Work	20.83	3.36	1.92	.05
Nonwork	26.60	4.83		
MSAS Total _a				
Work	19.33	2.62	1.92	.05
Nonwork	23.07	2.33		
MSAS (Subscale 2) _b				
Work	15.83	4.62	1.94	.05
Nonwork	14.17	1.94		

^aPhase 3

^bPhase 4, n = 13

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Table 6

Spearman Correlation Coefficients
Between Demographics (Phase 1)
&
Outcome Variables (Phases 2 & 3)

$n = 20^a$

	Hrs work/week	SES(M)	Ed(M)	Age	SES(F)	MS _b
Comps.		-.48*			-.50*	
MSAS1	-.69**	-.73**		.48**		
MSAS3	-.64*			.68*		
MSAS Total ^c	-.75**					
Family Apgar			.60**			
GA ^d	.70***					
Brazelton auto/stab		.58*	.57*		.61*	-.60**
motor		.49*			.50*	

* $p < .05$ ** $p < .01$ *** $p < .001$

^a (Phase 2 $n = 18$, $n = 15$)

^b Marital Status

^c Maternal Separation Anxiety Scale

^d Gestational age

Table 7

Family Apgar

Descriptive Statistics by Group and Phase¹

N = 15 (12)

Group	n	Mean	S.D.	Range
Working	8 (6)	8.00 (7.83)	2.33 (3.43)	3-7 (1-10)
Nonworking	7 (6)	7.00 (7.51)	3.37 (3.51)	1-10 (1-10)

¹ Phase 3 (Phase 4)